REMARKS

Applicant appreciates the Examiner's thorough consideration provided the present application. Claims 31-61 are now present in the application. Claims 53 and 55 have been amended. Claim 31 is independent. Reconsideration of this application, as amended, is respectfully requested.

Claim Rejections Under 35 U.S.C. §112

Claims 53 and 55 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. This rejection is respectfully traversed.

As the Examiner will note, claims 53 and 55 have been amended to address the Examiner's requested changes. Accordingly, all pending claims are now definite and clear. Reconsideration and withdrawal of the rejection under 35 U.S.C. § 112, second paragraph, are therefore respectfully requested.

Claim Rejections Under 35 U.S.C. §§ 102 & 103

Claims 31-34, 36-48, 50-52, 56, 58 and 60 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Kupfer, U.S. Patent No. 5,287,273. Claim 35 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Kupfer in view of Tatton, U.S. Patent No. 5,783,606. Claims 49, 54, 57, 59 and 61 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kupfer in view of Drane, U.S. Patent No. 5,377,681. These rejections are respectfully traversed.

Independent claim 31 now recites a combination of steps including "a) determining a time series of tomographic data pertaining to the organ or part of tissue during and after a bolus injection of a tracer dose to said mammal, the tracer being substantially intravascular in said tissue", "c) determining a residue function of the organ or of the part of tissue by deconvolution of the time series of tomographic data with the time series of concentration data", "d) determining a distribution of transit times from the negative slope of the residue function" and "e) determining a probability density function (PDF) of a haemodynamic index from the distribution of transit times". Applicant respectfully submits that the combination of steps set forth in claim 31 is not disclosed or suggested by the references relied on by the Examiner.

Kupfer discloses a method of determining a function of a target organ using a pre-calibrated imaging system (see Abstract). Although Kufper discloses a step of introducing a tracer bolus into the subject's circulatory system, Kupfer fails to teach "the tracer being substantially intravascular in said tissue" as recited in step a) of claim 31.

Kufper also fails to teach "c) determining a residue function of the organ or of the part of tissue by deconvolution of the time series of tomographic data with the time series of concentration data" as recited in claim 31. Kufper merely discloses determining a linear response function (LRF) by deconvolution. However, the LRF is the result of the multiplication of the residue function and the flow, not the residue function itself.

Kufper also fails to teach "d) determining a distribution of transit times from the negative slope of the residue function" as recited in claim 31. Kufper's LRF determined from the deconvolution was thought to describe the distribution of transit times, h(t), through the organ (see Equation (B); col. 7, line 50; col. 18, lines 5-7, stating that the 'first moment of the

LRF curve' is 'the transit time through the organ'). However, as was later pointed out by Weisskoff, Chesler, Boxerman & Rosen ('Pitfalls in MR measurement of tissue blood flow with intravascular tracers: which mean transit time?' Magn. Reson. Med. 1993 29(4):553-8), this is not true. Instead, the LRF merely describes the distribution of residence times, R(t). Kupfer, in col. 13, lines 39-41, specifically states a relation between h(t) and H(t)=1-R(t). However, Kupfer fails to relate it directly to the measured signal, thereby strongly demonstrating that Kupfer is unaware of the abovementioned, important distinction. In other words, Kupfer merely discloses determining a distribution of residence times, not a distribution of transit times.

Kufper also fails to teach "e) determining a probability density function (PDF) of a haemodynamic index from the distribution of transit times" as recited in claim 31. Kupfer finds an index in a spatial distribution of mean transit times in points. Unlike Kufper, in the step e) of claim 31, a distribution of transit times is found for each point, not just a single value (*i.e.*, mean transit time). Therefore, an extra dimension of data is extracted in the present invention, compared to Kupfer. In particular, the distribution of transit times has been proved to provide significant information from a medical point of view rather than merely calculating a mean transit time value. It has been proved that oxygen transport to cells can be both good and bad at a given mean transit time, while the distribution of transit times provides valuable information relating to oxygen transport to the cells.

Therefore, the method of claim 31 differs radically from Kupfer and other current kinetic analysis methods. Where Kupfer's method results in 2-dimensional functional images based on the LRF, the method of claim 31 enables generation of a 3-dimensional dataset where

temporal features (amplitude, first moment, etc.) that allow determination of 'common' kinetic parameters (transit time, flow, clearance) are indeed removed by normalization. Accordingly, analysis of temporal distributions in a single spatial location is possible - not by observing spatial distributions of 'common' kinetic parameters as described by Kupfer and similar prior art documents.

With regard to the Examiner's reliance on Tatton and Drane, these references have only been relied on for their teachings related to the subject matter of dependent claims. These references also fail to disclose the above combination of steps as set forth in independent claim 31. Accordingly, these references fail to cure the deficiencies of Kufper.

Accordingly, none of the references utilized by the Examiner individually or in combination teach or suggest the limitations of independent claim 31 or its dependent claims. Therefore, Applicant respectfully submits that independent claim 31 and its dependent claims clearly define over the teachings of the references relied on by the Examiner.

Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. §§ 102 and 103 are respectfully requested.

CONCLUSION

Since the remaining patents cited by the Examiner have not been utilized to reject the claims, but merely to show the state of the prior art, no further comments are necessary with respect thereto.

It is believed that a full and complete response has been made to the Office Action, and that as such, the Examiner is respectfully requested to send the application to Issue.

In the event there are any matters remaining in this application, the Examiner is invited to contact Joe McKinney Muncy, Registration No. 32,334 at (703) 205-8000 in the Washington, D.C. area.

Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), Applicant respectfully petitions for a three (3) month extension of time for filing a response in connection with the present application and the required fee of $1,020.00 is attached herewith.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

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